

REMARKS/ARGUMENTS

The Patent Office examines and rejects claims 1-16, 49-58 and 62-81. Applicants amend claims 4, 10-12, 49, 55-57, 67, 70, 72 and 81. Applicants canceled claims 17-48, 59-61 and 80. Applicants submit additional claims 81-84.

Applicants submit that no new matter is cited herein as amended to claim 4 as supported at least at paragraph [0004]; amendments to claims 10-12, 55-57 and 81 are to cure typographical errors; amendments to claims 67, 70 and 72 are supported at least at paragraph [0064]; additional claim 82 is supported at least at paragraphs [0064]-[0074]; additional claim 83 is supported at least at paragraph [0048]; and additional claim 84 is supported at least at paragraphs [0064], [0074] and Figure 6 of the Application. Applicants amend claims 12 and 49 as recommended by the Patent Office, and submit that no new matter is added therein as the amendments are at least supported at Figures 7 and 6, respectively of the Application.

Hence, Applicants respectfully request reconsideration of the pending claims and consideration of the additional claims in view of the remarks herein.

Claim Objection

Claims 4, 10-12, 55-57, 67, 70, 72 and 80-81 are objected to because of informalities. Applicants amend all of the claims, such as suggested by the Patent Office. Hence, Applicants respectfully request withdrawal of the objections above.

Double Patenting

Applicants appreciate the Patent Office's provisional obviousness-type double patenting rejection of claims 1-16, 49-58 and 62-81 provisionally rejected over claims 16-21, 24 and 31-43 of co-pending U.S. Patent Application No. 10/664,308. Applicants will address the provisional double patenting on issuance of one of the involved patents.

Claims Rejected under U.S.C. §112

Claims 12, 49-53 and 63-75 are rejected under 35 U.S.C. §112, second paragraph for various alleged unclear term. Applicants disagree.

However, Applicants amend claim 12 and submit that, as amended, claim 12 is clear.

Applicants also amend claim 49 as suggested by the Patent Office.

With respect to claims 63-65, 68 and 73, Applicants disagree that the terms "rigidity of the target" and "the target is rigid" are unclear. Applicants assert that upon reading the specification, especially at least paragraphs [0083] and [0095]-[0098], a practitioner would understand the meaning of those terms. Similarly, Applicants disagree that the terms "rigid body transform" of claim 15 are unclear. Upon reading at least paragraph [0085], a practitioner in the art would understand of those terms. Finally, Applicants disagree that use of the term "deformable" in claims 74-75 is unclear, and assert that upon reading at least paragraphs [0005], [0095] and [0098], a practitioner would understand the meaning of that term.

Claims Rejected Under 35 U.S.C. §103

The Patent Office rejects claims 1-3, 5-7, 13-14, 16, 49-58, 62 and 76-77 under 35 U.S.C. §103(a) as being unpatentable over U.S. Publication No. 2002/0193685 to Mate et al. (Mate) in view of U.S. Publication No. 2002/0065461 to Cosman (Cosman). Claim 4 is rejected under 35 U.S.C. §103(a) as being unpatentable over Mate in view of Cosman as applied to claim 1 above, and further in view of U.S. Patent No. 7,227,925 to Mansfield et al. (Mansfield). Claims 8-9, 12 and 78-81 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mate in view of Cosman as applied to claims 6-7 above, and further in view of U.S. Patent No. 5,757,953 to Jang (Jang). Claims 10-11 are rejected under 35 U.S.C. §103(a) as unpatentable over Mate in view of Cosman and Jang as applied to claim 8 above and further in view of U.S. Patent No. 5,446,548 to Gerig et al. (Gerig). Claims 15 and 63-72 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mate in view of Cosman as applied to claims 1 and 14 above, and further in view of U.S. Patent No. 6,073,044 to Fitzpatrick et al. (Fitzpatrick). Claims 73-

75 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mate in view of Cosman and Fitzpatrick as applied to claim 64 above, and further in view of Mansfield. For a claim to be obvious every limitation of that claim must be taught by at least one property combined reference.

Applicants respectfully disagree with the rejection above and submit that independent claim 1 is patentable over the cited references for at least the reason that none of the references teach imaging a plurality of markers in a first and in a second imaging modality, where the markers are implanted in a body; and determining first coordinates and second coordinates as required by claim 1.

Mate teaches a primary purpose of allowing target 12 to be accurately positioned at a treatment machine isocenter so that ionizing radiation is accurately delivered to target 12 (see ¶ [0035]). Mate teaches acceptably aligning target and machine isocenters 40 and 22 for radiation delivery from source 18 to irradiate a target (see cols. 35 and 39). In Mate, the imaging is performed in real time and during treatment (see ¶¶ [0035], [0037] and [0039]). Mate also teaches that the imaging is performed only by exciting markers 30 with excitation source 32 so that markers 30 resonate at a selected unique frequency and generate an underlying low energy radial-frequency magnetic signal measurable from outside body 14 by array 34 of sensors 36 (see ¶ [0036]). Thus, Mate does not teach imaging a plurality of markers in a first and in a second imaging modality, where the markers are implanted in a body; and determining first coordinates and second coordinates as required by claim 1. Moreover, Mate fails to teach the planned treatment beam isocenter and treatment beam isocenter of claim 2; the first and second imaging modalities of claim 4; the false markers of claim 12; the gantries of claim 60; the different session of claim 61; or the limitations of additional claims 82-84.

Cosman teaches percutaneously fixing a stud section to the iliac crest bone of the pelvis during treatment, so that an array of marker spheres can be attached to the stud above the surface of the skin at the time of treatment (see ¶ [0061] and Figure 3C). The markers are geometric objects to indicate position of patient location that are visible to a camera (see ¶ [0063]). Thus, the primary purpose of Cosman is to have the markers external to the skin so that they can be imaged with a camera in order to provide an optical tracking system to compare the location of the markers in images picked up a

camera system to align the target where target with the isocenter of a beam (see ¶¶ [0064]-[0065] and Figure 3C). Consequently, Cosman does not teach or motivate imaging markers implanted in a body using a first and second imaging modality as required by claim 1. Moreover, Cosman does not teach the planned treatment beam isocenter and treatment beam isocenter of claim 2; the first and second imaging modalities of claim 4; the false markers of claim 12; the gantries of claim 60; the different session of claim 61; or the limitations of additional claims 82-84.

In addition, by imaging markers that reside internal to a body in two modalities as required by the claims, some embodiments described in the specification, for example, without limitation thereto, provide at least one of: (1) the benefit of measuring radiation received by internal markers near anatomical landmarks to extrapolate the amount of radiation delivered to anatomical landmarks to minimize damage to such areas from treatment (see ¶ [0043] of the Application); (2) the benefit of determining more accurate positions of internal body areas having internal markers situated therein to ensure that a target volume (e.g., tumor) receives sufficient radiation and that injury to the surrounding and adjacent non-target volumes (e.g., healthy tissue) is minimized (see ¶¶ [0055] and [0074] of the Application); and/or (3) the benefit of imaging internal markers left in the body to provide more accurate positioning of a target volume during multiple treatment sessions to account for daily treatment machine setup variation and various types of organ movement (see ¶ [0078] of the Application). Thus, the invention may have any one or any combination of the foregoing benefits. However, the references do not contemplate or enable such benefits.

Applicants submit that Mansfield is not a proper reference in accordance with 35 U.S.C. §103(c) (see MPEP Section 706.02(I)) because the subject matter of Mansfield and the claimed invention were, at the time the claimed invention was made, owned by the person or subject to an obligation of assignment to the same person (e.g., Varian Medical Systems Technologies, Inc., of Palo Alto, California). Hence, for this additional reason, Applicants respectfully request the rejection above of dependent claims 4 and 73-75 be withdrawn.

Hence, Applicants respectfully request withdrawal of all the rejections above for all of the claims.

Additional Claims 82-84

Applicants submitted additional claims 82-84 are patentable over the cited references for at least the reasons provided above of their base claims as well as for additional limitations of dependent claims 82-84, such as is noted above.

CONCLUSION

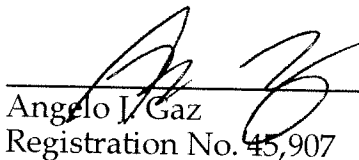
In view of the foregoing, it is believed that all claims now pending patentably define the subject invention over the prior art of record, and are in condition for allowance and such action is earnestly solicited at the earliest possible date. If the Examiner believes a telephone conference would be useful in moving the case forward, he is encouraged to contact the undersigned at (310) 207-3800.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2666 for any additional fees required under 37 C.F.R. §§ 1.16 or 1.17, particularly extension of time fees.

Respectfully submitted,

BLAKELY SOKOLOFF TAYLOR & ZAFMAN LLP

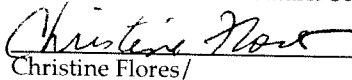
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CERTIFICATE OF TRANSMISSION

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7-24-08
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